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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/538,468	06/08/2005	Kwang-Jung Yun	69507(301067)	3656

21874 7590 11/09/2009

EDWARDS ANGELL PALMER & DODGE LLP
P.O. BOX 55874
BOSTON, MA 02205

EXAMINER	
SYKES, ALTREV C	

ART UNIT	PAPER NUMBER
1794	

MAIL DATE	DELIVERY MODE
11/09/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/538,468	YUN ET AL.	
	Examiner	Art Unit	
	ALTREV C. SYKES	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 April 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) *1-10* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment to the claims filed April 13, 2009 is acknowledged by examiner and has been entered.

Response to Arguments

2. Applicant's arguments with respect to claims 11-22 have been considered but are moot in view of the new ground(s) of rejection necessitated by amendment. Applicant points out that the fill member (12) of the Meyer reference is directed to a drawn film made by feeding an extruded polymer film to a slit roll. Examiner agrees; however, it is noted that Meyer also discloses obviously, other types of members or yarns may be employed as fill members 12, and combinations of such other types of yarns or members may be employed with or without fill members 12. (See Col 8, lines 15-19) Examiner notes that fibers are normally drawn to make them more crystalline and improve their tensile strength, but this is an extra processing step. It would have been obvious to one having ordinary skill in the art to have used undrawn fibers as "filler" material as these would add bulk to the fabric wherein the additional strength provided by the drawn fibers is not needed. As such, the step of drawing is no longer required in the process of Meyer.

3. Applicant also argues, that he fiber disclosed in the Meyer reference is a short fiber randomly arranged in a polymer (See Figures); by contrast, the fiber of the present invention is a long fiber continuously extended in a length direction of the strip.

4. Examiner is not persuaded by the argument. There seems to be no basis for applicant's position as Meyer is not explicit to short fibers in the disclosure and additionally refers to yarns repeatedly throughout. One of ordinary skill in the art would expect for a yarn to be of sufficient length thereby distinguishing it from what is known in the art as a short fiber. Further, applicant has provided no support for the position that the fiber is randomly arranged. Again, Meyer provides for a very comparable end structure to that of applicant and conveniently discusses in detail how to arrange the yarns for the geogrid. (See Meyer Figure 1 and Col 8, lines 39-50)

5. The new grounds of rejection as set forth below is made in view of newly found prior art and a different interpretation of previously applied art.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 11, 12, 16, 17, 19, 20, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meyer et al. (US 5,735,640) in view of Stevenson et al. (US 5,965,467).

Regarding claim 11, Meyer et al. discloses geogrids for earth reinforcement, stabilization and retention. Membranes used in such structures are formed by weaving a number of fill members, with a plurality of warp member sets, which are preferably formed of extruded polypropylene yarns. (See Abstract) The woven reinforcement membrane comprises a plurality of fill member sets disposed adjacent to one another. A plurality of warp member sets extend in a warp direction so that alternate warp members in each warp member set are positioned on alternate sides of each fill member intersected by the warp member set. Preferably, a plurality of pairs of locking yarn pairs bracket the warp member sets as they intersect the fill member sets, in order to assist in retaining the warp member sets in place. (See Col 5, lines 61-67) In desired applications, any polymeric material may be used, including polyethylene, polyester, fiberglass, combinations of these and/or other desired polymeric materials. (See Col 7, lines 42-46) Meyer also discloses obviously, other types of members or yarns may be employed as fill members 12, and combinations of such other types of yarns or members may be employed with or without fill members 12. (See Col 8, lines 15-19) Therefore, a prima facie case of obviousness exists for one of ordinary skill in the art to utilize other types of yarns for the

fill member 12 (including those not drawn). Examiner notes that fibers are normally drawn to make them more crystalline and to improve their tensile strength. It would have been obvious to one having ordinary skill in the art to have used undrawn fibers as "filler" material as these would add bulk to the fabric wherein the additional strength provided by drawn fibers is not required as set forth by Meyer. Examiner further equates the weave process of Meyer et al. to the bending of the polymer strips of applicant and for the crossing of longitudinal and lateral strips. Specifically, examiner equates the warp members to the longitudinal strip and the fill members to that of the lateral strips of applicant. Meyer et al. discloses the fill member sets, the warp member sets and the locking yarn pairs are formed with extruded polypropylene, because that material provides requisite strength and durability properties at low cost. In the preferred embodiment, the fill members and the warp members intersect. A binder coating is preferably placed on the woven structure, in order to hold the yarns in place. (See Col 6, lines 1-22) The members may be held in place by calendaring, tentering, welding or other conventional techniques and may be wholly or partially used in place of the locking members or in conjunction. (See Col 9, lines 33-38) As such, it is noted by examiner that the method of Meyer et al. is substantially similar to that of applicant and provides for a very comparable end structure. (See Meyer Figure 1) Additionally, it is noted by examiner that the polymer strips may be adhered by the locking yarns or a binder as disclosed by the Meyer reference. Meyer does not specifically disclose the fiber-reinforced polymer strip for the fill member having the structure claimed by applicant.

Stevenson et al. discloses a bonded composite open mesh structural textiles are formed of woven textile. The textile is formed from at least two polymeric components. The first component, or load bearing member, is a high tenacity, high modulus, low elongation mono- or multifilament yarn. The second component is a polymer in yarn or other form which will encapsulate and bond yarns at the junctions to strengthen the junctions. (See Abstract) Stevenson et al. discloses in the woven textile, a plurality of warp yarns are woven with a plurality of weft (fill) yarns. The weave preferably includes a half-cross or full-cross leno weave. (See Abstract) Examiner notes that Figure 1 as disclosed by applicant is bears a substantial resemblance to a blown up version of the woven textile 10 as taught by Figure 1 of Stevenson. Additionally, Stevenson et al. discloses the first component may comprise monofilament or multifilament polymeric fiber or bundle with each fiber being of homogenous or bicomponent structure. Where bicomponent fibers or fiber bundles are used to form such load bearing elements it is possible to achieve improved resistance to degradation (i.e., loss of key properties) when such materials are subject to installation and long term environmental stress in use (i.e., by using a core material most suited to achievement of desired mechanical properties and a different sheath material most suited to achievement of desired durability properties in a particular field of use). (See Col 4, lines 18-30) Stevenson et al. discloses the second component, a bonding element, is an independent polymeric material in monofilament or multifilament form and of homogenous or bicomponent structure which is used to encapsulate and bond the load bearing fibers particularly in the junction zones of the open mesh textile thereby strengthening the junction, stiffening the composite material, increasing its resistance to

elongation under load and increasing its resistance to degradation when subject to installation or long term environmental stress. (See Col 4, lines 30-39) Stevenson et al. also discloses in accordance with one embodiment where a fusible bonding yarn is used, the woven textile is heated to melt the fusible polymer component, i.e., to melt the monofilament bonding fibers or the sheath of the bicomponent bonding fibers. This causes the fusible polymer component to flow around and encapsulate the other components of the textile and protects, strengthens and stiffens the overall structure and particularly the junctions. (See Col 5, lines 12-19 and 44-48) Stevenson discloses suitable mono- or multifilament yarns are formed from polyester, polyvinylalcohol, nylon, aramid, fiberglass, and polyethylene naphthalate. (See Col 10, lines 20-23) Stevenson et al. discloses the woven textile can be finished by applying heat energy (e.g., calendaring, radio-frequency energy, microwave energy, infra-red energy and tentering). (See Col 12, lines 66-67 and Col 13, lines 1-5)

As Meyer et al. and Stevenson et al. are both directed to woven textiles, the art is analogous. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize either of the load bearing or bonding element yarns as taught by Stevenson et al. for the fill member as disclosed by Meyer et al. in order to achieve desired durability properties in a particular field of use and or to strengthen and/or stiffen the composite materials particularly in the junction zones. (See Col 4, lines 18-39) Additionally, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize bicomponent yarns produced through extrusion as taught

by Stevenson et al. in place of the polymer yarns as disclosed by Meyer et al. in order to provide a textile wherein each of the fibers therein would be coated on its surface with a polymer resin thereby providing tailored protection of the structure. (See Col 5, lines 12-19)

Regarding claims 12, 16 and 17 Meyer et al. further discloses alternate warp members 14 are separated during the weaving process as a fill member 12 is thrown, and the separation is then inverted at which time another fill member 12 is thrown. As a result, alternate warp members 14 in each set 36 are positioned on the front and back (top and bottom, first and second) sides 38 and 40, respectively, of membrane 10 or fill members 12 intersected by the warp members 14 and the warp member set 36. Additionally, for the same reasons, a particular warp member 14 is preferably positioned alternately on first and second sides 38 and 40 of successive fill members 12 intercepted by the warp member 14 or its set of warp members 36. (See Figure 1 and Col 8, lines 39-50) Meyer et al. discloses the membrane 10 is preferably, but need not be, coated with a binder coating after weaving is accomplished. The coating adheres well and serves to maintain fill members 12, warp members 14 and locking irons 16 in place. The coating may be applied by any other desired method. The members and other components of the membrane 10 may also or alternatively be held in place using calendaring, tentering, heat welding, ultrasonic welding, RF welding (radio frequency), or other conventional techniques. These may wholly or partially supplant locking members and/or the coating, or they may be used fully in conjunction with either or both. (See Col 9, lines 21-38)

Therefore, it would have been well within the ordinary skill of one in the art to adhere the warp and fill members of Meyer et al. at first and second points as the reference describes several ways for accomplishing holding the members in place including the combination of binder and welding. Additionally, examiner equates RF welding to vibration welding since the process requires subjecting the parts to be joined to a high frequency (13-100MHz) electromagnetic field, which is normally applied between two metal bars. The dynamic electric field causes the molecules in polar thermoplastics to oscillate. Depending on their geometry and dipole moment, these molecules may translate some of this oscillatory motion into thermal energy and cause heating of the material.(As evidenced by Plastics Joining Article)

Regarding claims 13 and 14, it is noted by examiner that applicant discloses the plurality of longitudinal fiber-reinforced polymer strips and the lateral fiber-reinforced polymer strips are crossed in a plain weave structure so that the first and second contact points are alternatively positioned in turns. (See [0010] and [0028]) Additionally, it is noted by examiner that the type of intersection of the longitudinal strip within the weave structure determines whether it is an n^{th} strip or $n+1^{th}$ strip. Therefore, one of ordinary skill in the art at the time of the invention would expect for the first and second contact points formed in turns as taught by Meyer et al. as well as the at least one longitudinal strip is an n^{th} strip to readily provided for in the method of making. Further, support for this obviousness is found in the use of like materials and/or like methods (i.e. a woven

structure of polymer yarns) which would result in the claimed property. (See Meyer Fig. 1) The burden is upon the Applicant to prove otherwise.

Regarding claim 15, Meyer et al. further discloses the fill members 12, warp members 14 and locking yarns 16 may be arranged as desired for any given application. In some applications, for instance, such as on a grade, it may be desirable to include more or larger warp members 14 if the warp direction corresponds to the grade (if the grade is in the fill direction, more fill members could be used.) Additionally, fill members 12 and warp members 14 may be arranged as desired within the membrane such as in desired bundles or sets as shown in FIG. 1, or in any other manner which may be desired for a particular application. (See Col 7, lines 47-56) Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to form at least two second contact points between the first two contact points in at least one of the longitudinal strips. The modification would be motivated by the particular application of the membrane for end use.

Regarding claim 18, Meyer et al. further discloses the coating may be applied by any other desired method including spray coating. The members and other components of the membrane 10 may also or alternatively be held in place using calendaring, tentering, heat welding, ultrasonic welding, RF welding (radio frequency), or other conventional techniques. These may wholly or partially supplant locking members and/or the coating, or they may be used fully in conjunction with either or both. (See Col 9, lines 21-38)

Therefore, it would have been well within the ordinary skill of one in the art to adhere the warp and fill members of Meyer et al. at first and second points as the reference describes several ways for accomplishing holding the members in place including the combination of binder and welding. The fixing of one point with binder while the other is welded would have been completely within the ordinary skill of one in the art at the time of the invention and would accomplish the entirely expected result of holding the yarns in place for a particular end formation.

Regarding claim 19, it is noted by examiner that no further insight is supplied by applicant's disclosure as to adhering the contact points step by step. As such, it is assumed by examiner that the limitation is encompassed in the weaving process and subsequent application of binder as disclosed by Meyer et al. (See Col 9, lines 21-38)

Regarding claim 20, Meyer et al. further discloses the weaving process may be carried out on conventional loom equipment employed to weave polypropylene or polymeric textiles. In the preferred embodiment, the loom is a Sulzer loom. (See Col 8, lines 51-55) The warp and fill members may be held in place using calendaring, tentering, heat welding, ultrasonic welding, RF welding (radio frequency), or other conventional techniques. (See Col 9, lines 33-38) Examiner equates the loom of Meyer et al. to a device including a strip arranging means. As such, the claim limitations are met by the prior art.

Regarding claim 22, Meyer et al. further discloses through holes formed in the warp member 14 so that the fill member 34 is inserted to pass through. (See Figure 2) Additionally, Stevenson et al. discloses through holes formed in the warp and weft direction thereby allowing yarns to pass through. (See Fig. 3B)

Regarding claims 23-25, it would have been well within the ordinary skill of one in the art to use conventionally available equipment to provide for adhering the members using heat welding, ultrasonic welding, RF welding, etc. as disclosed by Meyer et al. It would have also been obvious to one of ordinary skill in the art at the time of the invention to utilize welding units known in the art of producing structured members such as geogrids. As evidenced by Thermosonics, Ultrasonic Equipment Article, the type of machinery utilized would have been well within the skill of one in the art and would depend on the provisions necessary for the final product. As Meyer et al. discloses a weaving process in addition to welding, the claim limitations are met by the prior art.

9. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Meyer et al. (US 5,735,640) in view of Stevenson et al. (US 5,965,467) and further in view of Hendrix et al. (US 5,836,715)

Regarding claim 21, examiner maintains the position as set forth above for fill members 12. Meyer et al. discloses the bracketing pair of fill members 22 acts during the weaving process and afterward to hold the bracketed subset of fill members 20 in place. (See Col

8, lines 20-23) Further, each locking yarn 16 in a pair 42 is alternately positioned on first and second sides 38 and 40 of successive fill members 12 intersected by the locking yarns 16. Alternatively, the particular locking yarn 16 may catch its counterpart in the pair 42 between fill members 12 so that it always passes on either the first side 38 or the second side 40 of fill members 12. (See Col 8, lines 60-67) The warp and fill members may be held in place using conventional techniques. (See Col 9, lines 33-38) However, Meyer et al. fails to specifically disclose support grooves are formed on the bending members.

Hendrix et al. discloses a structural member for reinforcement of asphalt and concrete roadways and other products, and which comprises a gridwork of warp strands and weft strands which are disposed at right angles to each other and so as to define an open structure. (See Abstract) Hendrix et al. discloses the set of warp strands is corrugated into alternating ridges and grooves, and wherein the set of weft strands is substantially linear, so that the gridwork has a three-dimensional configuration. (See Col 4, lines 19-22)

As Meyer et al. and Hendrix et al. are directed to methods of making structural members, the art is analogous. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the grooves as disclosed by Hendrix et al. in the place of or in addition to the locking yarns as disclosed by Meyer et al. for the added benefit of holding the yarns in place while creating a three-dimensional configuration. (See Col 4, lines 19-22) Meyer et al. discloses that conventional techniques may be used

with or without the locking yarns. (See Col 9, lines 33-38) The modification would have been well within the ordinary skill of one in the art.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALTREV C. SYKES whose telephone number is (571)270-3162. The examiner can normally be reached on Monday-Thursday, 8AM-5PM EST, alt Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on 571-272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/
Supervisory Patent Examiner, Art Unit 1794

/ACS/
Examiner
10/28/09